

**Claims:**

1. Isolated human soluble guanylyl cyclase  $\alpha 1/\beta 1$  (hsGC $\alpha 1/\beta 1$ ) purified to apparent homogeneity.
2. A method for the production of  $\alpha 1$  and/or  $\beta 1$  subunits of human soluble guanylyl cyclase comprising the expression in prokaryotic or eukaryotic host cells of expression vectors containing the DNA sequence of hsGC $\alpha 1$  and/or hsGC $\beta 1$  and obtaining the subunit or subunits.
3. The method for producing the  $\alpha 1$  and/or  $\beta 1$  subunits of human soluble guanylyl cyclase according to claim 2, wherein the step of obtaining the subunit or subunits comprises a lysis of the cells, the affinity chromatography of the cell lysate, and the subsequent elution of the subunit or subunits.
4. The method for producing the  $\alpha 1$  and/or  $\beta 1$  subunits of human soluble guanylyl cyclase according to claim 2 or 3, wherein the expression vector contains at least one additional DNA sequence coding for a domain for the specific affinity chromatography (affinity tag) with appended protease cleavage site.
5. The method for producing  $\alpha 1$  and/or  $\beta 1$  subunits of human soluble guanylyl cyclase according to claim 4, wherein the expression vector contains the DNA sequence for hsGC $\alpha 1$  with affinity tag, the DNA sequence for hsGC $\beta 1$  with affinity tag, the DNA sequence for hsGC $\alpha 1$  with affinity tag, and the DNA sequence for hsGC $\beta 1$ , the DNA sequence for hsGC $\beta 1$  with affinity tag and the DNA sequence for hsGC $\alpha 1$ , or the DNA sequence hsGC $\alpha 1$  with affinity tag and the DNA sequence for hsGC $\beta 1$  with affinity tag.
6. The method for producing human soluble guanylyl cyclase  $\alpha 1/\beta 1$  (hsGC $\alpha 1/\beta 1$ ) comprising the separate expression in prokaryotic or eukaryotic host cells of an expression vector containing the DNA sequence for hsGC $\alpha 1$  or hsGC $\beta 1$ ,

extraction of the subunits, and reconstitution of subunits hsGC $\alpha$ 1 and hsGC $\beta$ 1 to form the dimeric guanylyl cyclase  $\alpha$ 1/ $\beta$ 1 (hsGC $\alpha$ 1/ $\beta$ 1).

- 5 7. The method for producing human soluble guanylyl cyclase  $\alpha$ 1/ $\beta$ 1 (hsGC $\alpha$ 1/ $\beta$ 1) according to claim 6, wherein the step for the purification of the subunits comprises a separate lysis of cells containing hsGC $\alpha$ 1 or hsGC $\beta$ 1, the separate affinity chromatography of the cell lysates, and the subsequent elution of the subunits.
- 10 8. The method for producing human soluble guanylyl cyclase  $\alpha$ 1/ $\beta$ 1 (hsGC $\alpha$ 1/ $\beta$ 1) comprising the coexpression of the DNA sequences of hsGC $\alpha$ 1 and hsGC $\beta$ 1 in prokaryotic or eukaryotic host cells, a lysis of the cells containing hsGC $\alpha$ 1 and hsGC $\beta$ 1, and affinity chromatography and subsequent elution of hsGC $\alpha$ 1/ $\beta$ 1.
- 15 9. Use of a nucleotide sequence encoding the hsGC $\alpha$ 1 and/or hsGC $\beta$ 1 subunits of human soluble guanylyl cyclase  $\alpha$ 1/ $\beta$ 1 for somatic gene therapy.
- 20 10. Use according to claim 9 for the prevention and therapy of atherosclerosis and its complications, of restenosis, ischemia (infarction), peripheral arterial occlusive diseases, and arterial hypertension as well as for the prevention of atherosclerosis in patients with risk factors.
- 25 11. Antibodies against human soluble guanylyl cyclase  $\alpha$ 1/ $\beta$ 1 (hsGC  $\alpha$ 1/ $\beta$ 1), obtainable by immunization of a mammal with hsGC $\alpha$ 1/ $\beta$ 1, the  $\alpha$ 1 or  $\beta$ 1 subunit, or immunogenic peptide fragments thereof and isolation of the antibodies.
- 30 12. Antibodies according to claim 11 obtainable by immunization of a mammal with the peptide fragment Phe-Thr-Pro-Arg-Ser-Arg-Glu-Glu-Leu-Pro-Pro-Asn-Phe-Pro, or parts thereof, or immunogenic peptide fragments that overlap with this fragment.

13. Antibodies according to claim 11 obtainable by immunization of a mammal with the peptide fragment Lys-Gly-Lys-Lys-Glu-Pro-Met-Gln-Val-Trp-Phe-Leu-Ser-Arg-Lys-Asn-Thr-Gly-Thr-Glu-Glu-Thr or immunogenic fragment or immunogenic peptide fragments that overlap with this fragment.